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L1 21 S E3-4,E6-7
E SKOLD R/AU
L2 32 S E3-7
L3 53 S L1-2
L4 2 S L3 AND PHYSICAL/TI
L5 325992 S TEMPERATURE AND CONCENTRATION
L6 163559 S (PHYSICAL OR CHEMICAL) (2A) PROPERTY
L7 30207 S L6(6A) (DETECT? OR DETERMIN? OR MEASUR? OR MONITOR? OR MODEL? OR
ANALY? OR TEST? OR ASSAY? OR INVESTIGAT? OR ESTIMAT? OR EVALUAT? OR
STUDY? OR STUDIE# OR CHARACTERI? OR SCREEN? OR SENSE# OR SENSOR OR
SENSING OR PROBE# OR PROBING OR QUANTIF?)
L8 888 S L5 AND L7
L9 311 S L8 AND (LIQUID OR SOLUTION OR EMULSION)
L10 18 S L8 AND ((3 OR 2) (1A) (D OR DIMENSION?) OR 3D OR 2D)
L11 19 S L8 AND (COMPUTER OR ALGORITHM OR CALIBRAT?)
L12 210 S L8 AND (MODEL? OR GRAPH? OR DISPLAY? OR REPRESENT? OR DIAGRAM)
L13 79 S L9 AND L12
L14 102 S L8 AND (TURBID? OR VISCOS?)
L15 64 S L9,L12 AND L14
L16 160 S L10-11,L13,L15
L17 134 S L16 NOT PY>1998
L18 26 S L16 NOT L17
L19 7 S L18 AND (PART OR REAL TIME OR PREDICT? OR PROFILE)/TI
L20 141 S L17,L19

=> d bib,ab 1-141 120

L20 ANSWER 7 OF 141 CA COPYRIGHT 2001 ACS

AN 130:84627 CA

TI Dependence of the thermal conductivity of alloys of the Al-Mg system on the composition and temperature

AU Vertogradskii, V. A.; Bel'skayal, I. N.

CS All-Russia Institute of Aircraft Materials (VIAM), Moscow, Russia

SO Met. Sci. Heat Treat. (1998), 40(5-6), 231-233 CODEN: MHTRAN; ISSN: 0026-0673

AB It is a common practice to study the dependencies of the phys. properties of alloys on the temp. and the compn. without generalizing the results. It is more logical to study these dependences complexly, i.e., as fragments of so-called compn.-temp.-property diagrams (whole diagrams in the ideal case). Today's math. and computer possibilities provide processing of the dependences of any property on the temp. and compn. even for multicomponent systems. Math. analogs replace the compn.-property graphical diagrams. The present work generalizes data on the thermal cond. of 11 alloys of the Al-Mg system that contain 1 to 14% Mg in the temp. range of 20-350°C. The results are obtained in the form of a single regression equation that describes the data on the thermal cond. within the range 86-190 W/(m•K) with a std. deviation of 0.7%. The choice of the regression equation is based on the existence of an analogy between heat transfer and elec. transfer in metallic systems and on dependences of the elec. resistivity on the temp. and the concn. of the alloying elements known from solid-state physics.

L20 ANSWER 13 OF 141 CA COPYRIGHT 2001 ACS

AN 128:50123 CA
TI Liquid-phase flow model of the two-phase external-airlift loop reactor
AU Wang, Jiwu; Li, Wenhong; Zhang, Mouzhen
CS Dept. Chem., Yanan University, Yanan, 716000, Peop. Rep. China
SO Huaxue Fanying Gongcheng Yu Gongyi (1997), 13(4), 350-357 CODEN: HFGGEU;
ISSN: 1001-7631

AB The RTD curves of liq.-phases were detd. by the pulse tracer technique in a two-phases external-airlift loop reactor (riser diam. 60 mm) with systems of air-water, air-urea soln., air-alc. soln. and air-CMC-Na soln. under different gas and liq. velocities and different concn. conditions. At the same temp., the phys. properties of water and the solns. were detd. An empirical correlation of the parameter N of the series perfect mixing flow tank model of liq. phase was obtained, and the correlation relates the parameter N quant. with the important phys. properties, primary operating conditions and characteristic size of the reactor (riser diam.).

L20 ANSWER 17 OF 141 CA COPYRIGHT 2001 ACS
AN 127:221287 CA
TI Self-diffusion of molecular probes in polymer gels: the test of a new physical model of diffusion
AU Zhu, X. X.; Masaro, L.; Macdonald, P. M.
CS Departement de chimie, Universite de Montreal, Montreal, H3C 3J7, Can.
SO Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.) (1997), 38(2), 594-595
CODEN: ACPPAY; ISSN: 0032-3934

AB The study of diffusion of solute mols. in polymers is important to the applications of polymer materials. Addn. of plasticizers in polymers, permeability through polymer membranes, miscibility of polymers and release of drug and other mols. from polymers are all related to the diffusion in polymer matrixes. Phys. models describing the self-diffusion of solutes in polymer systems are very much needed to predict or est. the diffusion rate of a component in a given polymer-solute mixt. The self-diffusion coeffs. of a series of solute probes, including small mols. and polymers such as poly(ethylene glycol)s in aq. solns. and gels of poly(vinyl alc.)s were measured using the pulsed-gradient spin-echo NMR techniques. The existing models can be used to describe self-diffusion only in some cases but have been found to be restricted in their applications. A new phys. model of diffusion is proposed, which can be used successfully to describe the effects of polymer concn., temp. and mol. size of small and large mols. in binary and ternary polymer systems.

L20 ANSWER 22 OF 141 CA COPYRIGHT 2001 ACS
AN 126:250366 CA
TI Studies on production technology of acid modified starch and its applications in foods
AU Ma, Tao; Zong, Xu; Zhao, Zengyu
CS Talimu Univ. Agric. Reclamation, Alaer, 843300, Peop. Rep. China
SO Shipin Gongye Keji (1996), (6), 35-40, 30 CODEN: SGOKE6; ISSN: 1002-0306
AB This study is concerned with the utilization of acid modified starch (AMS) in foods and its prodn. technol. Using the table of orthogonal anal. and regression anal., treatment conditions and important phys. property indexes of AMS were investigated and a math. model was established. The model is about the relationship between the properties of AMS, such as viscosity, transparency, gel stability and the treatment conditions: acid concn., temp., processing time and paste d. Employing the sensory evaluation method that is commonly to det. food quality, different quantity ranges for AMS produced under different treatment conditions for use in soft sweets and jam prodn. were difined. With relative viscosity as an index, the best combination of conditions for treatment matching the index were detd.

through optimal selection by computer. The results showed that AMS addn. to the soft sweets and jam not only reduced the sweetness of the products and improved the palatability, but also shortened the prodn. time and lowered the cost.

L20 ANSWER 27 OF 141 CA COPYRIGHT 2001 ACS

AN 126:10971 CA

TI Calibration of Solid Phase Microextraction for Air Analyses Based on Physical Chemical Properties of the Coating

AU Martos, Perry A.; Pawliszyn, Janusz

CS Department of Chemistry, University of Waterloo, Waterloo, ON, N2L 3G1, Can.

SO Anal. Chem. (1997), 69(2), 206-215

AB Solid-phase microextn. (SPME) with poly(dimethylsiloxane) (PDMS) is used to sample dynamic hydrocarbon std. gas mixts. with calibration for temp., relative humidity, gas velocities, and gas concns. Equilibration times were found to vary from 15 to 450 s, depending on the compd. Relative humidity greater than 90% at various temps. was found to decrease analyte mass loading by 10%. Investigation of linearity with PDMS showed all of the analytes had a linear relationship between mass loaded at equil. and the gas concns. studied. Analyte detection limits are better than those for conventional grab sampling (concn. with adsorbent tubes and anal. by gas chromatog. and flame ionization detection). Partition coeffs. (K) were established at various temps., yielding a linear relationship between log K and T-1. The linear expression has a slope that is a function of the gas const. and the analyte heat of vaporization (ΔH_v) and a y-intercept that is a combination of terms, among which are included the gas const., analyte ΔH_v , and activity coeff.; therefore, K values can be estd. using literature ΔH_v and ascertained at temps. for which a K was not detd. This removes the restriction that calibration and air sampling must be carried out at the same temp. A comparison of PDMS (100 μ m) fiber lengths (n = 13) revealed an av. fiber length of 1.02 ± 0.03 cm. An interfiber estn. of method precision (n = 10) yielded less than 9% RSD for all the test analytes. When a correction for fiber lengths was applied, the differences between the means of area counts for the individual fibers was statistically insignificant. SPME was successfully field-tested as a grab sampler and an integrated sampler to analyze air at an industrial site, with excellent agreement with traditional air sampling methods. This work suggests that ambient and industrial air sampling with SPME is possible with essentially no calibration of the sampling device. It is only necessary to know the analyte's K to the fiber at various temps. which is based on defined and empirically determinable phys. consts.

L20 ANSWER 28 OF 141 CA COPYRIGHT 2001 ACS

AN 125:342590 CA

TI Examination of the influence of the physical properties of gelatins on their gelling characteristics

AU Kobayashi, T.; Ohno, T.; Kobayashi, H.; Okawa, Y.; Togawa, T.; Komatsu, C.; Asano, H.

CS Graduate School Science Technology, Chiba University, Chiba, Japan

SO J. Photogr. Sci. (1996), 44(4), 116-122 CODEN: JPTSAF; ISSN: 0022-3638

AB In order to study the relationship between the gelling characteristics and the phys. properties of gelatin, five gelatin samples having different properties were prepd. by ultrasonic wave irradiation of the original gelatin. The setting times of these modified gelatins were measured by means of the thermal sensor method. The empirical expression $t = a \cdot (T/C) + b$, which was previously obtained from the setting time (t), the concn. of the gelatin soln. (C) and the cooling temp. (T), was applied to study the

gelling characteristics of gelatin. As a result of studying the relation between the coeffs. a, b and the phys. properties of the gelatins, it was found that the coeff. a depended on the percentage of high mol. components in the gelatin. It was clear that the viscosity of the modified gelatins irradiated with the ultrasonic wave influenced their gelling characteristics.

L20 ANSWER 31 OF 141 CA COPYRIGHT 2001 ACS

AN 125:225003 CA

TI Properties of palm oil-in-water emulsions stabilized by nonionic emulsifiers

AU Ahmad, K.; Ho, C. C.; Fong, W. K.; Toji, D.

CS Dep. Chem., Univ. Malaya, Kuala Lumpur, 59100, Malay.

SO J. Colloid Interface Sci. (1996), 181(2), 595-604

AB Palm oil-in-water emulsions prepd. using various ethoxylated nonionic emulsifiers were studied with respect to the effect of concn. and type of the selected emulsifiers, and the emulsification process itself on the properties of the emulsions obtained. The stability of the emulsion during storage was monitored. The phys. properties were characterized by particle size anal., turbidity, interfacial tension, and electrophoretic mobility measurements. Emulsion stability was strongly dependent upon the types of palm oil and emulsifier used and their concns. Stable emulsions with minimal creaming at room temp. for ≤ 6 mo can be prepd. with the right choice of emulsifier and under the correct conditions of emulsification. The influence of the interfacial layer of the emulsifier on emulsion stability is discussed.

L20 ANSWER 33 OF 141 CA COPYRIGHT 2001 ACS

AN 125:143846 CA

TI A New Physical Model for the Diffusion of Solvents and Solute Probes in Polymer Solutions

AU Petit, J.-M.; Roux, B.; Zhu, X. X.; Macdonald, P. M.

CS Departement de Chimie, Universite de Montreal, Montreal, PQ, H3C 3J7, Can.

SO Macromolecules (1996), 29(18), 6031-6036 CODEN: MAMOBX; ISSN: 0024-9297

AB A new phys. model for the interpretation of the diffusion of solvent and other solute mols. in polymer solns is proposed. In this model, the polymer soln. is regarded as a network where the diffusing mols. have to overcome periodic energy barriers of equal magnitude, where the distance between the barriers corresponds to the correlation length in polymer solns. as defined in de Gennes' scaling theory. This model applies to the diffusion of small mols. in polymer matrixes, such as ternary aq. systems of poly(vinyl alc.) (PVA) and binary org. solns. of PMMA. The model successfully interprets the diffusion of solute mols. and water in aq. polymer solns. and that of solvent mols. in org. polymer solns. In particular, the effects of polymer concn. and temp. on diffusion can be predicted. An energy barrier of 21 kJ/mol is calcd. from the variable temp. studies of self-diffusion in the range 23-53° carried out on a PVA-water-tert-BuOH ternary system.

L20 ANSWER 37 OF 141 CA COPYRIGHT 2001 ACS

AN 124:15342 CA

TI Influence of nonionic surfactants on the physical and chemical properties of a biodegradable pseudolatex

AU Frisbee, Steven E.; McGinity, James W.

CS Coll. Pharm., Univ. Texas, Austin, TX, 78712, USA

SO Eur. J. Pharm. Biopharm. (1994), 40(6), 355-63 CODEN: EJPBEL

AB The influence of nonionic surfactants on the phys. and chem. properties of poly(DL-lactide) (PLA) pseudolatexes was investigated. Two exptl. design

procedures were used to study the surfactants and emulsification variables involved in pseudolatex formation. An extreme vertices design was utilized to study the influence of surfactant blends on the size of the particles in the pseudolatex and the glass transition temp. (Tg) of films cast from those pseudolatexes. Results showed Pluronic F68 best minimized both particle size and Tg. Emulsion inversion points of the surfactants correlated with emulsification efficiency better than did published HLB values. A study of the effect of fixed-ratio polymer and surfactant concns. reduced the size of the nanospheres, showing that a lower internal phase viscosity was more important than the surfactant concn. A pseudolatex dispersion of PLA using Pluronic F68 was plasticized with tri-Et citrate (TEC) at varying concns., and the Tg was detd. from cast films. While Pluronic F68 alone significantly reduced the Tg of the PLA, the addn. of TEC further reduced the Tg and greatly enhanced film-forming properties. Drug cores contg. chlorpheniramine maleate were coated with the plasticized pseudolatex in an air suspension coater. Drug cores contg. chlorpheniramine maleate were coated with the plasticized pseudolatex in an air suspension coater. Drug release studies of these beads showed a sustained release over 48 h, and the release rate was shown to be stable over time.

L20 ANSWER 38 OF 141 CA COPYRIGHT 2001 ACS

AN 123:174925 CA

TI Fundamental study of cold heat-storage and heat-release systems of fine capsulated latent heat storage material-water mixture. 1. Physical properties evaluation of fine capsulated latent heat storage material-water mixture

AU Inaba, Hideo; Morita, Shin-ichi

CS Eng. Coll., Okayama Univ., Okayama, Japan

SO Nippon Kikai Gakkai Ronbunshu, B-hen (1995), 61(585), 1841-8 CODEN: NKGBDD; ISSN: 0387-5016

AB This work deals with phys. properties of a fine capsulated latent heat storage material-water mixt. The fine capsulated material consists of pentadecane (C₁₅H₃₂, m.p. of 283.1 K) as the core latent heat storage material and melamine resin as the coating material. The measured results of the phys. properties of the test mixt., i.e. d., latent heat and viscosity, were analyzed for the temp. region of solid and liq. phases of the core latent heat storage material (pentadecane). It was clarified that the addnl. properties law could be applied to the estn. of d. and latent heat of the fine capsulated latent heat storage material. Moreover it was found that the viscosity of the test mixt. increased with an increase in concn. of the fine capsulated latent heat storage material. Useful correlation equations of viscosity for the fine capsulated latent heat storage material-water mixt. were derived in terms of temp. and concn.

L20 ANSWER 39 OF 141 CA COPYRIGHT 2001 ACS

AN 123:116705 CA

TI Physical properties of oil-water emulsion with solid-liquid phase change

AU Inaba, Hideo; Morita, Shin-ichi; Nozu, Shigeru

CS Faculty Engineering, Okayama University, Okayama, 700, Japan

SO Transp. Phenom. Therm. Eng., Proc. Int. Symp., 6th (1993), Volume 1, 285-90. Editor(s): Lee, Joon Sik; Chung, Suk Ho; Kim, Ki Hyun. Publisher: Begell House, New York, N. Y. CODEN: 61KFAC

AB The measurements of phys. properties (latent heat, sp. heat, thermal cond., and viscosity) of an oil (tetradecane)-in-water emulsion were carried out in the temp. region involving a solid-liq. phase change. An interaction was obsd. between the dispersed phase (tetradecane), the continuous phase (water), and the anionic surfactant (plus nonionic polymer) with respect to

the sp. heat and thermal cond. of the emulsion. The surfactant exerted a great influence on the viscosity of the emulsions. The phase-change behavior of the dispersion material could not affect the viscosity characteristic of the emulsion, because of the high viscosity and small diam. of the dispersed phase. Correlation equations of the phys. properties for the emulsion were proposed in terms of temp. and concns. of the dispersed phase and the surfactant. The results have application in the use of an aq. slurry or emulsion as a phase-change material in cold or heat storage.

L20 ANSWER 40 OF 141 CA COPYRIGHT 2001 ACS

AN 122:185735 CA

TI Rheological properties of dextran related to food applications

AU McCurdy, R. D.; Goff, H. D.; Stanley, D. W.; Stone, A. P.

CS Dep. Food Sci., Univ. Guelph, Guelph, ON, Can.

SO Food Hydrocolloids (1994), 8(6), 609-23 CODEN: FOHYES; ISSN: 0268-005X

AB Chem., phys. and mech. properties of dextran were evaluated to assess the potential use of this microbial polysaccharide in food applications. Dextran demonstrated high soly. characteristics and promoted low soln. viscosities. Newtonian behavior was obsd. at concns. <30% wt./wt. for dextran (mol. wt 500,000). Higher mol. wt 'native' dextran solns. demonstrated slight pseudoplasticity at concns. >1.5% wt./wt. Dil. and concd. soln. behavior indicated the conformation of dextran in soln. is dependent on both mol. wt. and polysaccharide concn. At low concns. dextran (mol. wt 500,000) demonstrated properties typical of a 'random coil' polysaccharide. Increased concn. resulted in the polymer chain adopting a more compact coil geometry. Non-Newtonian behavior obsd. in 'native' dextran solns. (>1.5 wt./wt.) is attributable to the formation of inter-chain entanglements through polymer size effects and unique branching properties. Dextran (mol. wt 500,000) demonstrated two crit. concns. ($c^* = 4.7\%$ and $c^{**} = 19\% \text{ w/v}$); quasi-elastic light scattering measurements verified the coil overlap region ($c^* \sim 4.6\% \text{ w/v}$). Dynamic oscillatory evaluations indicated dextran (mol. wt 500,000) solns. exhibited dil. soln. characteristics at concns. <20% (wt./wt.) and obeyed the empirical Cox-Merz rule. "Native" dextran solns. (10-15% wt./wt.) demonstrated mech. spectra typical of concd. polysaccharide solns. Calorimetric anal. of ternary dextran:sucrose:water solns. demonstrated that dextran addn. modified the frozen system behavior of sucrose solns. Increasing dextran concn. effectively increased the onset of melting temps. (T_g) by as much as 12°C .

L20 ANSWER 42 OF 141 CA COPYRIGHT 2001 ACS

AN 121:49220 CA

TI Simultaneous determination of physical and chemical properties of sodium chloride solutions by near infrared spectroscopy

AU Lin, Jie; Brown, Chris W.

CS Dep. Chem., Univ. Rhode Island, Kingston, RI, 02881, USA

SO J. Near Infrared Spectrosc. (1993), 1(2), 109-20 CODEN: JNISEI

AB Near IR (NIR) spectroscopy has been investigated as a new technique for the simultaneous detn. of phys. and chem. properties of NaCl solns. The spectra of NaCl solns. (0 to 5M) were measured with cuvettes in the 1100-2500 nm and 680-1230 nm regions at temps. between 23.0 and 28.5° , and with a fiber-optic probe in the 1100-1870 nm region at room temp. ($23.0 \pm 0.5^\circ$). These spectra were correlated with various properties of NaCl solns. by principal component regression (PCR) and multilinear regression (MLR) models. The properties studied include water concn., d., refractive index, relative viscosity, f.p. depression, osmolality, elec. conductance and activity coeff. of NaCl. Very good correlations were found between the NIR predicted values and literature values. The results of this study

demonstrate that several properties of NaCl solns. can be detd. simultaneously with NIR spectroscopy. Remote sensing of the properties can be performed with the use of a fiber-optic probe.

L20 ANSWER 50 OF 141 CA COPYRIGHT 2001 ACS

AN 118:193140 CA

TI Numerical prediction of the flow of chemically reactive polymeric fluids
AU Lefebvre, L.; Keunings, R.

CS Unite Mec. Appl., Univ. Cathol. Louvain, Louvain-la-Neuve, B-1348, Belg.
SO Theor. Appl. Rheol., Proc. Int. Congr. Rheol., 11th (1992), Volume 1,
280-2. Editor(s): Moldenaers, Paula; Keunings, Roland. Publisher:
Elsevier, Amsterdam, Neth. CODEN: 58QRAE

AB The math. modeling and the computer simulation of processing flows
involving chem. reactive polymeric fluids are presented. A simulation tool
for predicting the evolution of velocity, temp., stress, and species concn.
fields during processing is developed. Governing equations are derived on
the basis of the 1st principles of continuum mechanics and phenomenol.
relations for the chem. kinetics and the evolving fluid rheol. The set of
coupled, nonlinear partial differential equations is solved numerically
using a specialized finite element technique. The numerical algorithm is
implemented in a large-scale computer code that allows for the prediction
of multidimensional flows in complex geometries.

L20 ANSWER 53 OF 141 CA COPYRIGHT 2001 ACS

AN 117:258985 CA

TI Spectroscopic determination of refractive index and dielectric constant at
interfaces, using photophysical probe molecules

AU Kavanagh, Robert J.; Iu, Kai Kong; Thomas, J. Kerry

CS Dep. Chem. Biochem., Univ. Notre Dame, Notre Dame, IN, 46556, USA

SO Langmuir (1992), 8(12), 3008-13

AB A UV-visible spectroscopic technique is proposed for the detn. of the
refractive index and dielec. const. in restricted regions. Both the
classical N. Bayliss(1950) model and a modified V. Bekarek(1988) model were
used to calc. the refractive index and dielec. const. of the media (e.g.
polymer, silica gel, and zeolite). The studies show that the refractive
indexes of these media are ~1.58 (polystyrene), ~1/33 (silica gel), and
~1.45 (zeolite X) (identical to literature values). Increasing the
pretreatment temp. of silica gel is shown to decrease the refractive index,
which indicates that the probe mol. is exposed to a less polar or
dehydrated environment. The refractive index in a zeolite is shown to
increase in the presence of coadsorbed water. On colloidal clay surfaces,
increasing the concn. of a long chain alkylpyridinium surfactant around the
adsorbed probe mol. is shown to decrease the refractive index in agreement
with the picture that the environment of the probe becomes more hydrophobic
as an aliph. surfactant layer builds up on the surface. The data agree
with earlier luminescence probe studies in this system. These studies
amplify and extend earlier luminescence probe studies in heterogeneous
media, and present a method for measuring addnl. phys. parameters to
describe complex systems.

L20 ANSWER 54 OF 141 CA COPYRIGHT 2001 ACS

AN 117:254468 CA

TI Effects of temperature and alkali concentration on the dynamic interfacial
tension between heavy oil and alkaline solutions

AU Chiwetelu, C. I.; Neale, G. H.; Hornof, V.; George, A. E.

CS Dep. Chem. Eng., Univ. Ottawa, Ottawa, ON, K1N 6N5, Can.

SO In Situ (1992), 16(3), 251-68 CODEN: ISOMDJ; ISSN: 0146-2520

AB A no. of alk. reagents (e.g., NaOH, Na metasilicate, and Na orthosilicate)

were screened for potential application in the waterflooding of heavy oil reservoirs at moderate temps. with a methodol. based on phys. and interfacial property measurements. The exptl. oil was a Saskatchewan crude with acid no. of 1.88 mg KOH/g oil and viscosity 475 mPa.s at 25°. The interfacial tension between this oil and distd. water was measured at 25-75°. These values were relatively unaffected by changes in temp. as well as by the contact time between the two phases. However, the viscosity of the oil decreased by 87% when the temp. was increased from 35° to 75°. The addn. of small quantities of alk. reagents (up to a max. concn. of 500 mM in salt-free water) resulted in significant redns. in the interfacial tension. These crude-alkali tension values were influenced by the alk. concn., the temp., and the interfacial contact time between the oil and aq. phases. A characteristic optimum concn. was found for each alkali that was temp. insensitive. The effect of extended contact time between the phases was most evident near the optimum concn. for each alkali. NaOH and Na metasilicate were interfacially more effective than Na orthosilicate for the crude oil and for the range of alk. concns. and temps. considered.

PD 380.43
L20 ANSWER 55 OF 141 CA COPYRIGHT 2001 ACS

AN 117:213094 CA

TI Living poly(α -methylstyrene) near the polymerization line. 1. Mass density and polymerization line for solutions in tetrahydrofuran

AU Zheng, K. M.; Greer, S. C.

CS Dep. Chem. Biochem., Univ. Maryland, College Park, MD, 20742, USA

SO Macromolecules (1992), 25(23), 6128-36 CODEN: MAMOBX; ISSN: 0024-9297

AB The mass d., ρ , of solns. of living poly(α -methylstyrene) (I) in THF as a function of temp. near the polymn. temp., T_p , is measured. The values are measured with a precision in d. of 4×10^{-5} ; the accuracy is limited by knowledge of the compn. to about 3%. $\rho(T)$ Data is compared to 2 models of equil. polymn. as a 2nd-order phase transition: the $n \rightarrow 0$ magnet model (Kennedy, S. J.; Wheeler, J., 1983) and the mean-field model (Tobolsky, A. V.; Eisenberg, A. J., 1962) as applied to a living polymer in a solvent. For both models, an ideal soln. of the ionic polymer in the solvent, and linear thermal expansions for the monomer, the polymer, and the solvent are assumed. The description of the data then requires the addn. of const. (background densities) for both models; the const. are probably related to the excess vols. of mixing. When such const. are included, both models provide good qual. descriptions of $\rho(T)$ for living I in THF. The $n \rightarrow 0$ magnet model is capable of more accurate representations of the data. A model for a living polymer in a solvent which is more appropriate than the $n \rightarrow 0$ model is the dil. $n \rightarrow 0$ model, but the equation of state of the dil. $n \rightarrow 0$ model has not yet been developed. That the $n \rightarrow 0$ model describes so well the data for a system which includes a solvent suggests that the solvent does not affect strongly the percentage conversion of monomer to polymer at a given ($T_p - T$). In the course of the measurements of the d. and of other phys. properties of this system, the polymn. line (the dependence of the polymn. temp. on the initial mole fraction of monomer x_m^*) is measured. Measurements det. $T_p(x_m^*)$ from the changes in the slopes of phys. properties (e.g., d.) and differ from detns. of the polymn. line which measure the monomer concn. at some value of T and then assumes the x_m^* when the polymn. line passes through that value of T.

L20 ANSWER 59 OF 141 CA COPYRIGHT 2001 ACS

AN 114:128378 CA

TI Investigation on changes in physical and technological properties of water-soluble sizing agents during the ultrafiltration process. Part I. Ultrafiltration of hydroxypropyl starch

AU Bayazeed, A.; Trauter, J.

CS Inst. Text. Verfahrenstech., Deutschen Inst. Text. und Faserforsch.
Stuttgart, Denkendorf, D-7306, Fed. Rep. Ger.
SO Starch/Staerke (1991), 43(1), 18-25 CODEN: STARDD; ISSN: 0038-9056
AB The effect of ultrafiltration (UF) operation on the stability of a sizing agent based on starch was studied. Hydroxypropyl starch (HPS) was used as a water sol. modified starch. The investigation was carried out in 2 categories: (a) effect of UF time (the concn. of the soln. was kept const. by recirculating the permeate), and (b) raising the concn. by discharging the permeate. The changes in the HPS soln. properties were assessed by investigating the rheol. properties (apparent viscosity as a function of filtration time, temp. and activation energy of flow) and mol. properties (Infra-Red spectroscopy, no. of av. mol. wt. (Mn), and mol. wt. distn.). The investigation was carried out on HPS solns. before, after, and during the ultrafiltration process. The results indicated that some degrdn. takes place during UF process.

L20 ANSWER 60 OF 141 CA COPYRIGHT 2001 ACS
AN 114:109662 CA
TI Structural properties of water-organic solvent mixtures: a correlation with physico-chemical properties of the solvent
AU Cipiciani, Antonio; Cruciani, Gabriele; Primieri, Stefania
CS Dip. Chim., Univ. Perugia, Perugia, I-06100, Italy
SO Gazz. Chim. Ital. (1990), 120(12), 757-63 CODEN: GCITA9; ISSN: 0016-5603
AB Water-org. solvent mixts., characterized by Principal Component Anal. (PCA) and selected by maximization of their dissimilarities, were studied by refractive index measurements as a function of the org. solvent concn. in the water-rich region (mole fraction of co-solvent $x_2 < 0.1$) and at a fixed temp. The results show the existence of a crit. solvent compn. $x_2 = x_2^*$, typical for each org. solvent, at which structural changes in the mixts. occur. The exptl. data were worked out by the PLS (Projection to Latent Structures) method in order to develop a general interpretative correlation model between the physico-chem. properties of each solvent and the x_2^* value of its water-org. solvent system. This chemometric approach leads to the interpretation that x_2^* depends mainly on the combination of some phys.-chem. properties.

L20 ANSWER 61 OF 141 CA COPYRIGHT 2001 ACS
AN 114:83017 CA
TI On-line, real-time determination of polymer properties in a continuous polymerization reactor
IN Buchelli, Alberto
PA du Pont de Nemours, E. I., and Co., USA
SO Eur. Pat. Appl., 19 pp.
PI EP 398706 A2 19901122 EP 1990-305324 19900517
US 5065336 A 19911112 US 1989-353690 19890518
PRAI US 1989-353690 19890518
AB The title process provides a method for online prediction of polymer properties in a continuously polymn. reactor in which an irreversible polymn. reaction occurred. Sensors provide axial temp. and pressure profiles in the reactor as well as monomer flow rates and concn. for detg. wt.-av. mol. wt., no.-av. mol. wt., and polydispersity. Based on a non-Newtonian fluid mechanics anal., differential influx anal. of side stream incorporation, and detn. of the moments of the mol. wt. distribution via a Newton-Raphson algorithm, the model calcs. an axial polymer properties profile. The online, real-time anal. measurement of polymer properties may be used to alert the operator to reactor problems, to optimize reactor operation during shut-down and start-up or rate changes. This allows correlation of polymer properties to product performance in down stream

processes. Numerous reactor flow diagrams, schematics, process flow diagrams, and polymer viscosity grafts are presented.

L20 ANSWER 66 OF 141 CA COPYRIGHT 2001 ACS

AN 112:26398 CA

TI Calculation of physicochemical properties of binary systems displaying chemical interaction. III

AU Sumarokova, T. N.

CS Inst. Khim. Nauk, Alma-Ata, USSR

SO Zh. Obshch. Khim. (1989), 59(7), 1484-93 CODEN: ZOKHA4; ISSN: 0044-460X

AB The concn. and temp. dependencies were detd. for a series of phys. properties (vapor pressure, d., n, ^{119}Sn , ^1H , ^{13}C NMR spectra, viscosity, surface tension, magnetic susceptibility, dielec. const., heat of mixing) for the SnCl_4 (A)-EtOAc (B) system. Calcd. and exptl. values are compared (without using activity coeffs.). Laser deviations between calcd. and exptl. property data at 0-30 mol.% SnCl_4 were obsd. for properties sensitive to chem. interaction; this confirmed the formation of AB₃ since its existence was not taken into account in the calcns. as was the formation of AB and AB₂. The physicochem. properties of AB and AB₂ were detd. and fitted to a linear dependence on temp. at 293.2-343.2 K.

L20 ANSWER 67 OF 141 CA COPYRIGHT 2001 ACS

AN 112:15699 CA

TI Extension of functional capabilities of the methods for determining solution concentrations by using nonselective physiochemical properties

AU Stal'nov, P. I.

CS All-Union Sci.-Res. Vitam. Inst., USSR

SO Zh. Anal. Khim. (1989), 44(6), 1018-24

AB A method is proposed of controlling soln. concn. by analyzing nonselective physico-chem. properties. Elec. cond., d., viscosity, ultrasound velocity, thermal cond. and heat capacity can be employed for control. The method is based on stabilization of a changing physicochem. property (dependent on concn. and temp.) at a certain, preset value. Adjustment to the preset level is performed by the temp. change. The temp. is an output information parameter. The scale range of the output parameter depends on the temp. coeff. of the physicochem. property. The possibility of the decrease of detection limits and errors is shown. Examples of detn. of inorg. substances are given. Components of the error of transducers were examd. for lab. and industrial anal.

L20 ANSWER 70 OF 141 CA COPYRIGHT 2001 ACS

AN 109:88140 CA

TI Studies on physical properties of some organochloro pesticides in methanol

AU Varma, R. P.; Bhatnagar, B. B.; Singh, Anuradha

CS Dep. Chem., D. A. V. Coll., Muzaffarnagar, 251001, India

SO Rev. Roum. Chim. (1988), 33(3), 305-11 CODEN: RRCHAX; ISSN: 0035-3930

AB Soly., d. and viscosity of organochloro pesticides in methanol were detd. at 35-50°. Apparent heats of soln. of pesticides, calcd. from soly. data, were in the order: DDT < endosulfan < BHC. Viscosity and d. data were anal. using various equations showed that solute-solvent interaction occurred in pesticide solns. in methanol. The effects of temp. and pesticide concn. on the fluidity of pesticide solns. were discussed in the light of Arrhenius and Eyring equations and activation parameters of viscous flow, viz. ΔH^* , ΔS^* and ΔG^* , were calcd. The nonlinear variation of ΔG^* with concn. of pesticide confirms the observation of solute-solvent interaction.

L20 ANSWER 73 OF 141 CA COPYRIGHT 2001 ACS

AN 105:229130 CA
TI Surfactant systems for drag reduction: physicochemical properties and rheological behavior
AU Ohlendorf, D.; Interthal, W.; Hoffmann, H.
CS Angew. Phys., Hoechst A.-G., Frankfurt, D-6230/80, Fed. Rep. Ger.
SO Rheol. Acta (1986), 25(5), 468-86 CODEN: RHEAAK; ISSN: 0035-4511
AB The phys. chem. of drag-reducing surfactants is discussed. These surfactants form rodlike micelles above a characteristic concn. (Ct). The exptl. evidence for rodlike micelles and the prerequisites that the surfactant system must fulfill in order to form rodlike micelles are discussed. The elec. cond. shows that the crit. concn. for the formation of spherical micelles has little temp. dependence, while Ct increases rapidly with temp. The length of the rodlike micelles decreases with increasing temp. and increases with increasing surfactant concn. The dynamic processes in these micellar systems at rest and the effects of additives, such as electrolytes and short chain alcs., are discussed. The rheol. behavior of the surfactant solns. under laminar and turbulent flow conditions was examd. Viscosity measurements in laminar pipe and Couette flow show the build-up of a shear-induced, viscoelastic state (SIS) from normal Newtonian-fluid flow. A complete alignment of the rodlike micelles in the flow direction in the SIS was verified by flow birefringence. In turbulent pipe flow, drag redn. occurs in the surfactant systems as soon as rodlike micelles are present. The extent and type of drag redn., depends directly on the size, no., and surface charge of the micelles. The friction-factor curve changes in the same characteristic way as a function of temp. For each surfactant, independent of concn., an upper abs. temp. limit (TL) for drag redn. exists which is caused by the micellar dynamics. TL is affected by the hydrophobic chain length and the counterion of the surfactant system. An attempt is made to explain the drag redn. by combining the results of the rheol. measurements with the phys.-chem. properties of the micellar systems.

L20 ANSWER 74 OF 141 CA COPYRIGHT 2001 ACS

AN 105:126956 CA
TI Teniposide-induced changes in the physical properties of phosphatidylcholine liposomes. A calorimetric study
AU Wright, Stephen E.; White, J. Courtland
CS Bowman Gray Sch. Med., Wake Forest Univ., Winston-Salem, NC, 27103, USA
SO Biochem. Pharmacol. (1986), 35(16), 2731-5 CODEN: BCPCA6; ISSN: 0006-2952
AB The interaction of teniposide [29767-20-2] with defined model membranes was examd. by monitoring drug-induced changes in the melting profile of phospholipids by differential scanning calorimetry. The main phase-transition temp. of dimyristoyl- or dipalmitoylphosphatidylcholine was lowered and broadened by the presence of teniposide in the liposomes. These effects were essentially linear over the concn. range of 1-5 mol %. The calorimetric enthalpy of the gel-to-liq.-cryst. transition of the phospholipids was not changed by the addn. of the drug. The characteristic pretransition of these satd. phospholipids was decreased by teniposide concns. as low as 0.1 mol % and was abolished at concns. >1 mol %. The data confirm the lipophilic nature of teniposide and indicate that the nonspecific interactions with membrane lipids should be considered when evaluating the membrane-related effects of this agent.

L20 ANSWER 76 OF 141 CA COPYRIGHT 2001 ACS

AN 104:56716 CA
TI Densities and viscosities of supersaturated potash alum aqueous solutions
AU Kubota, Noriaki; Shimizu, Kenji; Itagaki, Hideo
CS Dep. Appl. Chem., Iwate Univ., Morioka, 020, Japan

SO J. Cryst. Growth (1985), 73(2), 359-63 CODEN: JCRGAE; ISSN: 0022-0248
AB Densities and relative viscosities were detd. for aq. K alum solns. of different concns. over a wide range of temps. from the undercooled to the supercooled region. Neither the densities nor the relative viscosities showed any sudden change even in the supercooled state, but they gradually and continuously changed with temp. from the undercooled to the supercooled region. This is important for practical use, since it makes it possible to est. these phys. properties in the supercooled region by extrapolating data in the undercooled region. Exptl. equations which give the densities and the relative viscosities were obtained as a function of temp. and of satn. temp.

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L20 ANSWER 81 OF 141 CA COPYRIGHT 2001 ACS

AN 100:38428 CA

TI Control of chemical-treatment solutions

PA Ishihara Yakuhin Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

PI JP 58161758 A2 19830926 JP 1982-42468 19820316

AB Chem.-treatment solns. (e.g., Cu electroless coating solns.) are sampled at a definite period to det. the phys. or chem. properties, (e.g., temp., concn., viscosity, pH) the proportional supply amt. of chem.-treatment solns. is then calcd. on the basis of the difference between the detd. phys. or chem. properties and the std. ones, the const. supply amt. of solns. is then calcd., and both the proportional and const. supply amts. of solns. are fed into the operating solns. for replenishment. Time delay of control is minimized.

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L20 ANSWER 93 OF 141 CA COPYRIGHT 2001 ACS

AN 84:46448 CA

TI Determination of critical micelle concentration and study of physical properties of aqueous solutions of calcium soaps

AU Varma, R. P.; Bahadur, P.

CS Dep. Chem., Dayanand Anglo-Vedic Coll., Muzaffarnagar, India

SO Cellul. Chem. Technol. (1975), 9(4), 393-401 CODEN: CECTAH

AB Micelles were apparently formed at concns. of 0.010, 0.005, and 0.002 M for Ca valerate, Ca caproate, and Ca caprylate, resp. The size of micelles was calcd. The cond. of Ca soaps in water at various temps. was described by $\log \mu = A + B \log C$, where A and B were consts. and C was the soap concn. in g mole/l. The values of A varied with temp. The dissocn. const., molar conductance at infinite diln., and heat of dissocn. were calcd. The crit. micelle concn. was unaffected by temp.

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L20 ANSWER 98 OF 141 CA COPYRIGHT 2001 ACS

AN 78:99694 CA

TI Simulation of dissolution processes in apparatus containing mixers. II. Experimental determination of the effect of the physical properties of a solution on the kinetics of dissolution in apparatus containing a mixer

AU Zundeleovich, Yu. V.; Vigdorchik, E. M.

CS USSR

SO Tr. Proekt. Nauch.-Issled. Inst. "Gipronikel" (Gos. Inst. Proekt. Predpr. Nikelevoi Prom.) (1972), No. 54, 108-14 CODEN: TPNGAP

AB The rate of dispersion in the external diffusion range substantially depends on hydrodynamic conditions of the process. The concn. function ψ (c) taking into account the influence of phys. properties of the soln. of a given concn. c on the mass-transfer coeff. very significantly depends on temp. In a rather narrow temp. rage, it may be considered as a function of concn. c only. The concn. function ψ (c) was detd. for an aq. K₂Cr₂O₇ soln. Four expts. were made at 20° by using 200 ml H₂O for 10 g K₂Cr₂O₇.

The concn. function ψ (c) was an objective measure of the influence of phys. properties of the liq. phase. It is unambiguously detd. by the concn. of the soln. and does not depend either on mixing conditions in the reactor or on the state of the solid phase.

L20 ANSWER 104 OF 141 CA COPYRIGHT 2001 ACS

AN 75:131990 CA

TI Critical micelle concentration (CMC) of flotation reagents and its relation to hydrophile-lipophile balance (HLB)

AU Lin, I. J.

CS Columbia Univ., New York, N. Y., USA

SO Trans. Soc. Mining Eng. AIME (1971), 250(3), 225-7 CODEN: TMENAE

AB Surfactants are classified according to the size and strength of the hydrophilic and lipophilic groups of the mol. The balance of these 2 opposing groups is the HLB. A lipophilic surface-active agent is assigned a low HLB no. and a hydrophilic one a high no. On the basis of known group values defined empirically by Davies and Rideal, $HLB = \Sigma$ (hydrophilic group nos.) - Σ (hydrophobic group nos.) + 7. HLB nos. are also found in works by P. Sherman and by M. Hellsten. So far, their application has been confined to the selection of emulsifiers. Aq. solns. of surface-active agents are characterized by a steep change in phys. properties (equiv. conductance, transport no., n , surface tension, d , turbidity, f.p. depression, and viscosity) over a narrow concn. range. This rapid change is attributed to formation of oriented aggregates, or micelles, at a CMC that depends on the no. of C atoms in the chain and is important in selecting surfactants. For different cationic and anionic collectors, and for hydrocarbon emulsions in flotation systems, $\log CMC = A - Bn$, where n is the no. of C atoms in the long hydrocarbon chain (and the equiv. effective no. of CH_2 groups in a nonlinear chain), and A and B are consts. for a particular temp. and homologous series. As chain length is a parameter common to HLB and CMC and detcs. their values, $\log CMC = a + b$ (HLB). Tabular values yield a relationship among a , b , A , and B . Two graphs for aq. solns. of Na fatty acid soaps and Na alkyl sulfates correlate HLB or n and the CMC.

L20 ANSWER 109 OF 141 CA COPYRIGHT 2001 ACS

AN 68:88754 CA

TI Modification of fibrous disperse structures of lithium stearate in hydrocarbon oils

AU Shchegolev, G. G.; Trapeznikov, A. A.

CS Inst. Fiz. Khim., Moscow, USSR

SO Probl. Fiz.-Khim. Mekh. Voloknistykh Poristykh Dispersnykh Strukt. Mater., Mater. Konf. (1967), Meeting Date 1965, 569-603 CODEN: 19TXAA

AB The effects of the conditions of cooling and additives on the structure and phys.-mech. properties of Li stearate (I) greases were studied on a model grease consisting of nonpolar liq. petrolatum and 10% I, M.V.P. oil contg. 10% I, and industrial I grease. A I grease consists of a 3-dimensional network of fibrous I contg. the liquid hydrocarbon phase. The shear strength (Pr) and degree (S) to which the oil could be pressed out of the grease were detd. There was an inverse relation between Pr and S . The data obtained on Pr and S were correlated with structural data on the Li soap phase obtained by electron photomicrography. With rapid cooling of the isotropic soln., a decrease in the rate of cooling at $t_1 = 130^\circ$ (delay of cooling at this temp.) contributed to development of a max. value of Pr (min. value of S) in grease of all three types studied. With slow cooling ($\sim 1^\circ/\text{min.}$) there was a linear increase of Pr with increasing temps. t_1 of the delay in cooling for I + liquid petrolatum and a max. of Pr at $t_1 = 130^\circ$ for the industrial grease that had been digested at $40-85^\circ$, contained

impurities, and had a particulate (platelets) rather than fiber structure of I. Addn. of I-liq. petrolatum of C6-18 satd. fatty acids in optimum concns. increased Pr. This effect decreased with increasing chain length of the acids. Addn. of nonyl alc. or Ph₂NH did not affect significantly the properties of I greases. Addn. of Li oleate in the optimum amt. of 10% of I + Li oleate increased Pr by 50% and reduced S by 25%. Addn. of LiOH in amts. of 0- ~0.04 mole/mole I increased Pr, while its addn. in amts. >0.1 mole/mole I reduced Pr. In tests on samples of grease with a const. LiOH concn., there was a more pronounced effect of t_l on S than on Pr. Under the influence of LiOH, the size of I particles and their aggregates decreased, so that oil was retained more effectively in the I network. Upon addn. of Li naphthenate, Pr first increased and then decreased with increasing amts. of the additive. The Pr max. was at 0.5% and 1% Li naphthenate for rapidly and slowly cooled grease, resp. The effects of Li naphthenate in altering the structural strength of the greases were not assocd. with changes in pH. This was also observed for Li oleate. The sedimentation vol. of I pptd. with gasoline from I greases contg. Li naphthenate varied in a direct relation to Pr.

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ANSWER 114 OF 141 CA COPYRIGHT 2001 ACS

67:68064 CA

Temperature derivatives of viscosity, density, and refractive index for the water-ethanol system. I. Refractometric and flow activation energy charts for dilute aqueous alcohol from 2% to 11% alcohol and some concentrated ethanol solutions

AU

CS

SO

AB

Qureshi, Tayeb M.; Haider, Zohra; Qurashi, Mazhar M.

Pakistan Council Sci. Ind. Res., Karachi, Pakistan

Pak. J. Sci. Ind. Res. (1966), 9(1), 1-8 CODEN: PSIRAA

In the course of a systematic study of the temp. derivs. of various phys. properties of the H₂O-EtOH system, data were detd. on the deriv. of n (dn/dT) and viscosity ($E_{\eta} = T^2 \frac{d \ln \eta}{dT}$) for solns. at the 2 ends of the system: (1) those contg. 2 to 11 wt. % EtOH, and (2) those contg. 92 to 95 wt. % EtOH. dn/dT was detd. essentially by measuring the change every 2° in θ , the angle of emergence of the light beam from the cell of a Pulfrich refractometer, contg. the particular soln. under investigation. For 9% and 10% EtOH in H₂O, the plots of $\Delta\theta$ against temp. exhibit the sinusoidal variations already observed at other concns. The corresponding plots obtained with 3.6% and 5.7% EtOH solns. exhibit roughly sinusoidal variations of (-dn/dT). The min. of (-dn/dT) nearly coincide with the jumps in activation energy E_{η} for viscous flow of the dil. EtOH solns., and a tentative chart was prepd. contg. a series of graphs, each showing the variation of temp. for a particular jump (and min. of -dn/dT) as the EtOH concn. varies from 2% to 11%. A similar chart is given for the max. in (-dn/dT), and some anomalies are noted. Similar refractometric measurements were made for 92-95% EtOH, where certain abrupt changes had previously been observed in the cyclic variations of activation energy. The growth of an anomalous max. and min. is followed very readily on the dn/dT curves. The results agree with earlier findings. Thus, the refractometric observations confirm the occurrence of a significant structural change inside the liquid, in the above-mentioned ranges of temps. and water content. Also, it is significant that the max. of (-dn/dT) for 5.1% H₂O in EtOH agree with the min. of E_{η} rather than the max.

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ANSWER 115 OF 141 CA COPYRIGHT 2001 ACS

67:4072 CA

Rapid determination of certain physical properties regarding the absorption of halogenated hydrocarbons in the gaseous phase by means of organic solvents [used in absorption refrigerators]

AU Palla, Lanfranco
CS Ist. Super. Sanita, Rome, Italy
SO Calore (1966), 37(11), 474-88 CODEN: CALOAJ
AB Methods and app. used in measuring phys. properties of gases and liquids used in absorption refrigerators are described, notably gas-liquid mixt. concn. related to temp.-pressure, d., vol. change, verification of Raoult's law, surface tension, and Engler viscosity. Typical data curves using iso-BuOAc are illustrated.

L20 ANSWER 132 OF 141 CA COPYRIGHT 2001 ACS

OREF 57:4101a-c

TI Study of solubility in water-salt systems by the graphoanalytical method of sections

AU Zhuravlev, E. F.; Sheveleva, A. D.

CS State Univ., Perm

SO Zh. Neorgan. Khim. (1960), 5, 2630-7

AB cf. CA 51, 3263a. A theoretical account is given of the use of the isothermal method of sections in constructing triangular compn. diagrams for ternary systems composed of 2 salts, having a common ion, and H₂O. The sections method consists in detg. at a given temp. some precise and easily measured phys. property of the liquid phase of complexes prep'd. from the components of the system, the concn. of the components being varied. A graph of the magnitude of the phys. property plotted vs. compn. consists of intersection lines; the points of intersection denote the concns. of equil. phases. A series of such graphs enables the compn. diagram to be constructed. A very convenient and successful property for investigating the liquid phases is that of n. The following systems are discussed: (a) systems in which the components do not form compds. or solid solns., (b) systems with cryst. hydrate components, (c) systems in which the components form compds., and (d) systems with solid solns. formed from the anhyd. salts. The system H₂O-Cu(NO₃)₂-Ce(NO₃)₃ is illustrative of systems (c). Both salt components form cryst. hydrates, viz., Cu(NO₃)₂·3H₂O and Ce(NO₃)₃·6H₂O, from the aq. system the hydrated double salt Cu(NO₃)₂·Ce(NO₃)₃·4H₂O is formed.

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FILE 'CA' ENTERED AT 19:41:52 ON 18 JUN 2001

L1 362691 S (THREE OR 3 OR TWO OR 2) (1A) (D OR DIMENSION?)
L2 9457 S L1(4A) (PLOT? OR GRAPH? OR CONTOUR? OR SURFACE)
L3 29785 S L1(4A) (DIAGRAM? OR MODEL? OR DISPLAY? OR REPRESENTATION)
L4 22 S (PHYSICAL OR CHEMICAL) (2A) PROPERTY(6A) (L2 OR L3)
L5 60 S (TURBID? OR VISCOS?) (7A) L2-3
L6 1468 S L2-3 AND TEMPERATURE AND (CONCENTRATION OR COMPOSITION)
L7 492 S L6 AND PROPERTY
L8 94 S L7 AND (COMPUT? OR ALGORITHM OR EQUATION)
L9 174 S L4-5, L8
L10 142 S L9 NOT PY>1998
L11 113 S L10 NOT (LWR OR WWR OR ISING OR UPWIND OR WAVE OR MELT)
L12 102 S L11 NOT (PYROTEC? OR TORCH OR ORE OR FLAME OR COMBUST?)
L13 79 S L12 NOT (TRANSPORT OR NETWORK OR STRAIN OR STAINLESS STEEL)
L14 70 S L13 NOT (ALLOY OR FOAM OR DOT OR SOLAR OR SINTER?)

=> d bib, ab 1-70 114

L14 ANSWER 12 OF 70 CA COPYRIGHT 2001 ACS

AN 126:6722 CA

TI Mathematical characterization of the plasticizing and antiplasticizing effects of fructose on amylopectin

AU Peleg, Micha

CS Massachusetts Agricultural Experimental Station, Amherst, MA, MA 01003, USA

SO Cereal Chem. (1996), 73(6), 712-715 CODEN: CECHAF; ISSN: 0009-0352

AB Published data indicate that admixt. of fructose to amylopectin increases the latter's stiffness, but lowers its glass transition temp. range and makes the transition sharper. It also dramatically increases the plasticizing effect of absorbed moisture. These effects are quantified in terms of the parameters of a math. model based on Fermi's equation, which can describe mech. changes at and around the glass transition of biopolymers, irresp. of whether it is sharp or broad. This model accounts for the mixt.'s stiffness dependency on both the fructose concn. and temp., or moisture, with a single algebraic expression. It can also be used to create three-dimensional plots from which the combined effects of fructose and temp., or moisture, can be viewed, and conditions of plasticization, or antiplasticization, be identified.

L14 ANSWER 14 OF 70 CA COPYRIGHT 2001 ACS

AN 125:97128 CA

TI Three-dimensional rendering and phase analysis of the CaO-Al₂O₃-SiO₂ system

AU Speyer, R. F.

CS Sch. Mat. Sci. Eng., Georgia Inst. Technol., Atlanta, GA, 30332-0245, USA

SO J. Phase Equilib. (1996), 17(3), 186-195 CODEN: JPEQE6; ISSN: 1054-9714

AB A program for rendering ternary phase equil. in 3-point perspective was developed using Microsoft Visual Basic. Algorithms for rendering and phase anal. are described. With the software, liquidus, subliquidus, and solidus surfaces can be generated, and the three-dimensional object can be rotated to any angle for viewing. The operator can select a compn. on the top-view 2-dimensional projection, and surfaces pertinent to an isoplethal study will be displayed. A phase anal. plot is simultaneously displayed wherein relative proportions and compns. of phases are enumerated for any chosen temp. Phase anal. calcns. were based on methods of anal. geometry using best-fit polynomials for liquidus surfaces and their contact boundaries. Phase anal. involved sepn. into one of five possible modes of phase evolution during cooling.

L14 ANSWER 17 OF 70 CA COPYRIGHT 2001 ACS

AN 123:288145 CA

TI Cure modeling for polymer matrix composites

AU Ruffner, Dan

CS McDonnell Douglas Helicopter Company, Mesa, AZ, 85205, USA

SO Int. SAMPE Symp. Exhib. (1993), 38(, Advanced Materials: Performance through Tec), 999-1008 CODEN: ISSEEG; ISSN: 0891-0138

AB Modeling of epoxy resin (Fiberite 977-2) is reported. The models use DSC and rheol. dynamic spectroscopy (RDS) data to evaluate the cure and viscosity responses of the composite material during cure. The cure rate and the corresponding viscosity is established for the range of processing times and temps. Basic properties of the resin during cure can be obtained from three dimensional representations of cure and viscosity responses. Areas where degree of cure is very stable and viscosity is low can be readily identified as having potential for dwells. Areas where degree of cure is changing rapidly can be identified and avoided if resin exotherm is a concern.

L14 ANSWER 23 OF 70 CA COPYRIGHT 2001 ACS
AN 121:264876 CA
TI High-pressure phase equilibria study of the hydrogen-water fluid mixture
AU Scalise, O. H.; Rodriguez, A. E.
CS Instituto de Fisica de Liquidos y Sistemas Biologicos, IFLYSIB, UNLP-
CONICET-CICPBA, CC 565 (1900), La Plata, Argent.
SO Fluid Phase Equilib. (1994), 99(1-2), 49-62 CODEN: FPEQDT; ISSN: 0378-3812
AB The phase behavior of aq. fluid binary mixts. is investigated by the
application of thermodyn. perturbation theory to the polarizable hard-sphere
dipole model. Isotherms and isobars of the three-dimensional pressure-
temp.-compn. phase diagram are calcd. for the H₂-H₂O fluid mixt. The iso-
therms and isobars investigated in this work are compared with the exptl.
data.

L14 ANSWER 24 OF 70 CA COPYRIGHT 2001 ACS
AN 121:180779 CA
TI The compatibility of linear low density polyethylene-polypropylene blends:
viscosity ratio plots
AU Bains, M.; Balke, S. T.; Reck, D.; Horn, J.
CS Dep. Chem. Eng. Applied Chem., Univ. Toronto, Toronto, ON, M5S 1A4, Can.
SO Polym. Eng. Sci. (1994), 34(16), 1260-8 CODEN: PYESAZ; ISSN: 0032-3888
AB Effects of viscosity of the component phases on the mech. properties of
LLDPE/polypropylene (PP) blends were studied to obtain a method for
compatibilizing diaper manufg. waste. When viscosity of the components was
more closely matched to each other, increases of as much as 50% in the
tensile strength and modulus were obsd. over the "rule of mixts." line. SEM
showed a more diffuse interface between the component phases. Three-dimen-
sional views of plots of viscosity ratio of the blend components as a func-
tion of temp. and shear rate were used to demonstrate the closer matching
of viscosities for the blend components of the higher performing blends.
In processing diaper manufg. waste, addn. of a high-mol.-wt. PP in a
manufg.-scale single-screw extruder to provide a closer match of viscosi-
ties of the blend components, significantly improved the mech. properties.

L14 ANSWER 34 OF 70 CA COPYRIGHT 2001 ACS
AN 115:9849 CA
TI Viscoelasticity and effects of interphase interaction in blends of normal
and liquid crystalline thermoplasts
AU Semakov, A. V.; Kantor, G. Ya.; Vasil'eva, O. V.; Dobrosol, I. I.;
Khodyrev, B. S.; Kulichikhin, V. G.
CS Inst. Neftekhim. Sint. im. Topchieva, Moscow, USSR
SO Vysokomol. Soedin., Ser. A (1991), 33(1), 161-9 CODEN: VYSAAF; ISSN:
0507-5475
AB Viscoelastic characteristics (Young's modulus, loss modulus, loss tangent)
of blends of bisphenol A-dichlorodiphenyl sulfone copolymer with liq.-
cryst. dihydroxyphenyl-isophthalic acid-terephthalic acid copolymer were
detd. by the dynamic mech. method in the shear deformation regime in the
whole range of the blend compns. at temps. ranging from -150° to +200°.
Computer processing of the exptl. results permits to present them as 3-
dimensional modulus-temp.-blend compn. diagrams or 2-dimensional maps of
modulus isolines. This approach led to the detection of small shifts in
the positions of the α - and γ -relaxation transitions of one polymer in the
presence of the other polymer. Splitting of the glass temp. of the
polysulfone was explained by differences in the relaxational mobility of
its macromols. near the interphase and further away from the interphase.
Anal. of the exptl. data using the Tsyo-Halpin model led to the conclusion
about enhanced interaction of the components of the blend in the
interphase.

L14 ANSWER 36 OF 70 CA COPYRIGHT 2001 ACS

AN 114:70006 CA

TI Ternary systems water-alkane-sodium chloride and methanol-methane-sodium bromide to high pressures and temperatures

AU Michelberger, T.; Franck, E. U.

CS Inst. Phys. Chem., Univ. Karlsruhe, Karlsruhe, D-7500, Fed. Rep. Ger.

SO Ber. Bunsen-Ges. Phys. Chem. (1990), 94(10), 1134-43

AB Exptl. results are reported for the fluid phase equil. of the ternary system H₂O-C₂H₆-NaCl, H₂O-hexane-NaCl and CH₃OH-CH₄-NaBr. Measurements were extended to 800 K and 250 MPa and to 450 K and 200 MPa with the methanol system. A "synthetic" method, described earlier, was used with a high pressure autoclave with improved sapphire window arrangement. Pressure-temp. curves on the three-dimensional pTx-phase boundary surfaces at const. compns., x, were obtained ("isopleths"). Temps., pressures and molar densities along 14, 5 and 7 isopleths for the systems with ethane, hexane and methanol-methane, resp., are reported. Salt concns. between 0.1 and 8 wt. percent, relative to water or methanol, are applied. The addn. of salt shifts the fluid-fluid two-phase region to higher temps. and pressures in all three systems. The isobaric and isothermal shifts in certain regions can reach 100 K and more and 500 bar and more with 8 wt. percent of salt. Even with only 0.1 wt.%, 15 K shifts are obsd. near the resp. crit. curves. For the H₂O-C₂H₆-NaCl and the H₂O-hexane-NaCl systems computational descriptions of the isopleths, based on a "quasi-binary" approach and a recently derived rational equation of state are given.

L14 ANSWER 40 OF 70 CA COPYRIGHT 2001 ACS

AN 111:213920 CA

TI Study of a pattern database for polymer material

AU Inui, Shigeru; Shibuya, Atsuo; Suwa, Hiroshi

CS Res. Inst. Polym. Text., Tsukuba, 305, Japan

SO Kenkyu Hokoku - Sen'i Kobunshi Zairyo Kenkyusho (1989), (160), 29-34
CODEN: SKZHA8; ISSN: 0371-0807

AB A description is given of a graphics database for polymer material properties. A total of 738 various 3-dimensional diagrams representing the phys. properties of 32 polymer materials are stored on an optical disk. Seventy three query keys can be used for retrieval of each data set.

L14 ANSWER 41 OF 70 CA COPYRIGHT 2001 ACS

AN 111:84966 CA

TI An approach to the problem of the dependence of the dissociation constant of weak electrolytes on the temperature and on the solvent composition in the ethane-1,2-diol-2-methoxyethanol solvent system

AU Franchini, Giancarlo; Marchetti, Andrea; Preti, Carlo; Tassi, Lorenzo; Tosi, Giuseppe

CS Dep. Chem., Univ. Modena, Modena, 41100, Italy

SO J. Chem. Soc., Faraday Trans. 1 (1989), 85(7), 1697-707

AB This empirical approach to clarify the problem of the dependence of the dissocn. consts. of weak electrolytes on temp. and compn. of mixed solvents systems (X) is applied to the dissocn. const. of picric acid in ethane-1,2-diol, in 2-methoxyethanol and in their binary mixts. The data are those of previous work (recalcd. by means of the more accurate Fuoss-Hsia equation) integrated by the exptl. data relative to 3 new mixts. Two equations of the dependence of K on T and of K on X, resp., are suggested and good accordance between exptl. and calcd. values is shown. Starting from the 2 above-mentioned equations, general empirical equations for the surface K(T,x) are proposed; the av. difference between calcd. and exptl. K values is ~8%. A three-dimensional plot of the function K = K(T,X) is presented.

The proposed empirical models are compared to that obtained for the previously studied ethane-1,2-diol-water solvent system and advantages and limitations of the models are discussed.

L14 ANSWER 42 OF 70 CA COPYRIGHT 2001 ACS

AN 110:58720 CA

TI Computerized PVC formulating for optimized cost/performance

AU Brofman, C. M.; Caillaud, J. J.; Krauskopf, L. G.

CS Intermed. Technol. Div., Exxon Chem. Co., Baton Rouge, LA, 70821, USA

SO J. Vinyl Technol. (1988), 10(3), 148-53 CODEN: JVTEDI; ISSN: 0193-7197

AB Computerized profit-performance consulting (COPPCO) formulating program for PVC formulations has capabilities for i) selection of plasticizers from a group of 34, ii) selection of property modeling equations from a group of 5 exponential types, and iii) plotting in 3 dimension the effects of both plasticizer and filler concn. on any of the plasticizer,s performance properties. The COPPCO capabilities were illustrated by showing that in general purpose PVC applications diisononyl phthalate (I) displayed cost performance advantages over bis(2-ethylhexyl) phthalate (II). Also, low-temp. performance properties were compared for I-II blend vs. heptyl, nonyl, undecyl phthalate.

L14 ANSWER 47 OF 70 CA COPYRIGHT 2001 ACS

AN 103:148098 CA

TI Three-dimensional PTx phase diagrams through interactive computer graphics

AU Charos, Georgios N.; Clancy, Paulette; Gubbins, Keith E.; Naik, Chandrashekhar D.

CS Sch. Chem. Eng., Cornell Univ., Ithaca, NY, 14853, USA

SO Fluid Phase Equilib. (1985), 23(1), 59-78 CODEN: FPEQDT; ISSN: 0378-3812

AB Interactive computer graphic techniques were developed for the display of binary mixt. phase diagrams. The diagrams are defined in temp.-pressure-compn. space, and are pictured as wireframe objects with depth perception in order to provide a three-dimensional effect. The displays used were vector refresh workstations whose transformation hardware allows real-time rotation, rescaling, and translation of the diagrams, while software allows the extn. of const. property Px, Tx, PT, and x-y plots. The equil. surfaces and the crit. lines were calcd. by using the Redlich-Kwong equation of state and its Soave modification.

L14 ANSWER 59 OF 70 CA COPYRIGHT 2001 ACS

AN 92:169832 CA

TI Jar test flocculation of silica dispersions with cationic polyelectrolytes. Influence of pH

AU Pulkkinen, Erkki; Petaja, Timo

CS Dep. Chem., Univ. Oulu, Oulu, SF-90570/57, Finland

SO Finn. Chem. Lett. (1980), (1), 23-7 CODEN: FCMLAS; ISSN: 0303-4100

AB The suitability of cryst. SiO₂ (Min-U-Sil 5, Pennsylvania Glass and Sand Corp.) as a ref. colloid in flocculations with cationic polyepichlorohydrin derivs. was evaluated by jar tests at pH 3-9. Three-dimensional diagrams of equal supernatant turbidity on coordinates of pH and polymer dosage shown that at pH 3 and 5 the optimum polymer dosage remains nearly unchanged for each polymer and is many times smaller than at pH 7.5-9. At pH 5-7.5 fluctuations in the optimum dosage and incomplete dispersion set in, rendering this region less suitable for polymer evaluation. The measurements suggest that SiO₂ particles have self-coagulation properties at ~ pH 6.5.

=> log y

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